Inter-Department Communication

CALIFORNIA INSTITUTE OF TECHNOLOGY
PASADENA

(Date) 10-17-40

To C. Stock

From I. Campbell

Subject EGG

A few grains scraped from the edge of the outer layer were powdered and examined in immersion oil under the petrographic microscope. There are at least two constituents: one having very low index and low birefringence, the other with high index and high birefringence. The two are intimately intermixed, and since crystals of both are only of the order of only 1/100 mm. in dimension, the determination of precise optical constants, necessary for specific determination, would be fraught with some difficulty; but it should not be impossible. It would, however, be a time-consuming task.

For what a mere guess may be worth, I think it not unlikely that the low index material is a montmorillonite (similar in some respects to bentonitic clay); the high index material might possibly be anhydrite ($CaSO_4$). I should not want to be quoted on this in a paper, unless it is stated that the remark is only a "reconnaissance guess"!

For what negative statements may be worth, I can confidently state that the material is <u>not</u> quartz, nor opaline silica, nor gypsum, nor carbonate, nor kaolinite, nor any of the common sedimentary minerals.

If your friend considers specific identification important (and in view of the possibly unusual character of the material, I should think it might be) I would suggest that she commission some of our good optical mineralogists, such as Louis Regan or Alex Smith, to undertake the work. It probably would not cost more than $10.00 nor less than $5.00.

Ian.

September 1940

Mr. Robert F. Heizer
Department of Anthropology
University of Oregon
Eugene, Oregon.

Dear Mr. Heizer:

Thank you for your letter which gives me a little more light on the egg cast. I judge from this letter, however, that you thought you had given me more information in your first letter. All you said at that time was "It was found by Gordon Frazer at Pyramid Lake, Nevada."

So perhaps there is still more that I can learn. May we therefore start at the beginning:

Who is Gordon Frazer? Where does he live?

When was the egg collected?

Is the specimen the property of the University of Calif. or?

Where on Pyramid Lake was it collected: north, south, east, west rim, near any known point?

Conditions of collecting: near a deposit of tufa?
near a deposit of lake clay?

The fact that the material making up the cast of the egg is not tufa and contains no carbonate, makes me feel that I should try to give a little more data to back up a stagement regarding the age and origin of the specimen, if I am to record it.

Perhaps I could get in touch with Mr. Frazer myself and save you further bother, if you can give me his address.

Carnegie 1925
Ecology # 3 1/2

UNIVERSITY OF OREGON
COLLEGE OF SOCIAL SCIENCE
EUGENE, OREGON

DEPARTMENT OF ANTHROPOLOGY

Sept. 22, 1940.

Dear Dr. Howard:

Your letter received. I'm glad you found something in the egg to interest you.

As I explained in my first letter, the egg was collected under somewhat unfavorable circumstances, and I learned all I could when I got it. This I have already told you.

From your questions, I suspect that you are wondering whether it might not be fairly recent, and not of Pleistocene dating. I believe that it is not recent because it was found well <u>above</u> the present level and recently exposed shoreline (due to historic dessication). Thus, if a mallard had laid this egg while the lake was in its present state (e.g. such as seen by Frémont, its discoverer) it could not have found a resting place above the lake levels, granting that the internal replacement could have occurred under water. J.C. Jones (Carnegie Inst. series) notes that tufa deposition is still going on in Pyramid Thus the action of algae. The specimen was found on the surface, presumably where it was resting after breaking away from a matrix such as surrounded the first specimen described in the <u>Condor</u> by Gretmore. I suspect this last, because the surface is smooth, as though the shell was

recently removed. So far as I know, nothing was found with it.

If you wish, you could send me a copy of your note when it is written, and could look it over & return it the same day.

Sincerely yours,

Robert F. Heizer

length 60.5
breadth 42.4

UNIVERSITY OF CALIFORNIA

DEPARTMENT OF ANTHROPOLOGY
BERKELEY, CALIFORNIA

July 20, 1940

Dear Dr. Howard:

Under separate cover I am sending on to you a pseudomorph after an egg; part of the shell is still present. I thought you might like to publish a note on it, perhaps in The Condor where Wetmore has written a note on a similar find (Vol. XLI, No. 3: 98-99, 1939). When the egg has undergone study, I should be grateful to receive it back.

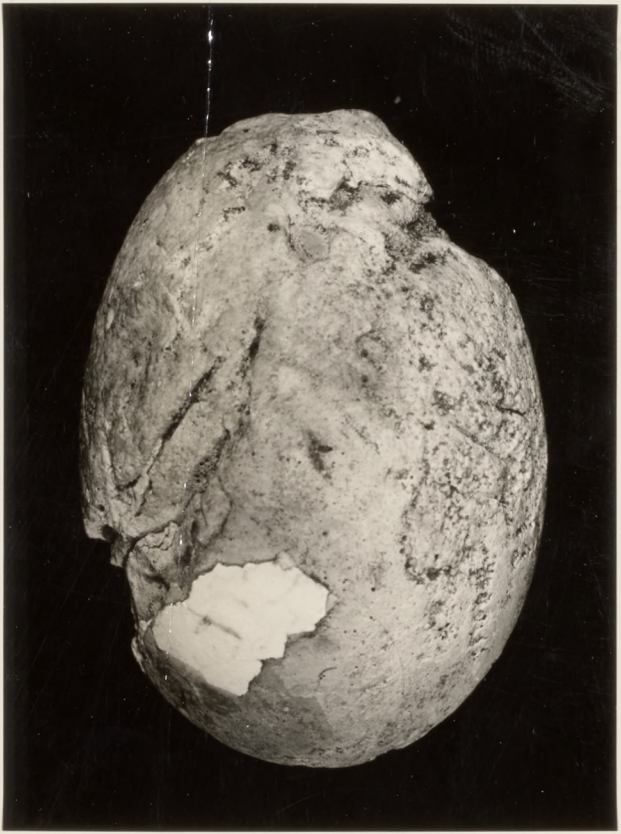
Here are what data I can offer. It was found by Gordon Frazer at Pyramid Lake, Nevada. The lake is a remnant of the older and larger Lake Lahontan (there is a big literature on this by I.C. Russell, J.C. Jones, Antevs and others), and the egg almost certainly dates from the later phases of the Pleistocene lake. As to the how and why of the filling of the egg with calcareous tufa, I cannot say — any good geologist can help you figure this out.

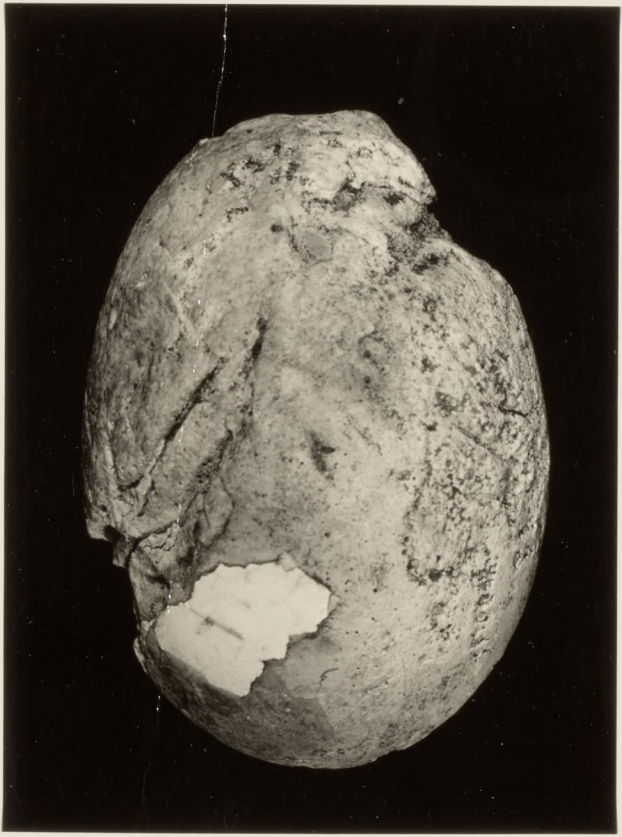
I might suggest that the bird bones from the deepest levels of the Leonard Rockshelter (10 mi. NE of the Lovelock Cave in Nevada) which you identified for us in 1938, are probably ascribable in time to early post-dessication times of Lake Lahontan when the country was assuming its present configuration. The deepest bones lay directly upon the Lahontan gravels. This may or may not be of some aid.

This summer we collected a very large number of bird bones from sites at Drakes Bay. Would you care to have a try at their identification? We should appreciate it, as we have your many other past favors.

Sincerely,

Robert F. Heizer.





Unpublished

Data insufficient

In July of this year we received from Mr. Robert Heizer of the University of California Museum of Anthropology, a cast of an egg with part of the shell adhering.

The information accompanying the specimen is unfortunately very scant, namely that it was found by Mr. Gordon Frazer of where? in date , above the historically exposed shorelines of Pyramid Lake on the surface of the ground, presumably having broken away from its original matrix near by.

The cast is of ~~tufa~~ matrix such as is common along the shores of old Lake Lahontan, of which Pyramid Lake is a remnant. Though there is some difference of opinion as to the age of these large upper (tufa) deposits, they are generally conceded to be late Pleistocene in age.

A similar find backed with accurate data, reported by Wetmore (Condor, 1939, vol. 40, pp. 98-99, fig. 29) lends further significance to the present specimen and has prompted us to record the occurrence in spite of lack of precise field data.

The cast measures approximately 60 mm. x 42.2mm. in its diameters and appears ~~mix~~ very slightly larger at one end than the other. (17.3 x 10.5 mm.) The small piece of shell adhering to this larger end measures approximately .3 mm. in thickness.

This Description written by Geo. Willett?

Suffered Tobe from Pyramid Lake but there is some doubt about this.

Received 1940 from Robt. Heizer Univ. Calif. Berkeley

Although, because of its size and shape, this egg was tentatively identified as that of a duck as soon as it was brought in to us, it was carefully compared with eggs of birds of several other groups. Among these were cormorants, herons, and the Western Grebe (Aechmophorus occidentalis), all of which lay eggs of a size similar to that of the specimen studied, and also might easily have been members of the same fauna. Fortunately, the fragment of shell still adhering to the cast was in such a good state of preservation that a microscopic examination of the shell characters appeared to justify elimination of all the above mentioned birds and to rather definitely fix the specimen as belonging to some member of the family Anatidae.

~~As~~ The only members of the duck family that lay eggs as large as the specimen under consideration (~~60.4X42.5 mm.~~), and are likely to have bred in the locality where it was found, are the Mallard (Anas platyrhynchos), the Redhead (Nyroca americana), the Canvas-back (Nyroca valisineria), and the Ruddy Duck (Erismatura jamaicensis). ~~the~~ Comparison was therefore most carefully made with the eggs of these species. The egg of Erismatura was quickly eliminated from consideration by reason of its very different shell texture. A much more careful comparison was necessary, however, to differentiate between the eggs of Anas and Nyroca. There is not only much similarity in the texture of the egg-shell in these two groups, but there is considerable variation among eggs of the same species. Furthermore, although the fragment of shell attached to the fossil egg was in excellent condition, considering its age, it is very possible that it has altered somewhat since the egg was laid.

In general, the pattern of the sculpture and pitting of the shell appears to be more clear-cut and widely spaced in eggs of

Anas than in those of *Nyroca*, and as the fossil shell fragment is most like the former, it may be considered a reasonable assumption that the egg is that of the Mallard (*Anas platyrhynchos*).

There are, of course, at least two factors that render a conclusive identification impossible in a case of this kind. The specimen might be the product of some species of bird that no longer exists, or it might not be typical in its characters. However, while either of these is a possibility, neither appears to be very probable.